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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/757,636	01/11/2001	Shalom Yariv	1052-US	8035

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EXAMINER

BOOKER, KELVIN E

ART UNIT

PAPER NUMBER

2121

DATE MAILED: 04/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/757,636

Applicant(s)

YARIV, SHALOM

Examiner

Kelvin E Booker

Art Unit

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: Detailed Office Action.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. **Claims 1-10** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. **Claims 1, 9 and 10** are directed towards the use of data compression algorithms to express and reconstruct target symbol sequences, without disclosing any computer implemented processing. Abstract ideas (see Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759) or the mere manipulation of abstract ideas (see Schrader, 22 F.3d at 292-93, 30 USPQ2d at 1457-58) are not patentable.

As disclosed, independent **claims 1-10** focus on nonfunctional descriptive material, which is inclusive of the mere arrangement of data without engaging functionality when employed as a computer component.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims one and two** are rejected under 35 U.S.C. 102(b) as being anticipated by Morano et al., "Longest Common Subsequence" [hereafter Morano].

As per claim 1, Morano teaches of a method of expressing a target symbol sequence *T* relative to a reference symbol sequence *R*, the method comprising the steps of:

a) identifying a first longest common substring (LCS) of symbols in said sequences *T* and *R* (see pages DAM3-DAM7: identifying LCS respective of A and B);

b) defining said first LCS as a root node of a tree, said root node comprising said first LCS's starting position in said sequence *R*, either of said first LCS's length and said first LCS's ending position in said sequence *R*, and said first LCS's starting position in said sequence *T*, said root node being a parent node (see pages DAM7-DAM8: defining root node respective of AB);

c) for each portion of said sequence *T* that precedes or succeeds said LCS in said sequence *T*:

d) where there is a portion of said sequence *R* corresponding to said portion of said sequence *T*:

e) identifying a subsequent longest common substring (LCS) of symbols in said portions (see page DAM8);

f) if said subsequent LCS is identified, defining said subsequent LCS as a child node of said parent node, said child node comprising said subsequent LCS's starting position in said sequence *R*, either of said subsequent LCS's length and said subsequent LCS's ending position in said sequence *R*, and said subsequent LCS's starting position in said sequence *T* (see pages DAM7-DAM8: considering child nodes of AB tree);

g) if said subsequent LCS is not identified, defining a child leaf of said parent node, said child leaf comprising the starting position of said portion of said sequence *T* in said sequence *T* and said portion of said sequence *T* itself (see pages DAM7-DAM8); and

h) where there is no portion of said sequence R corresponding to said portion of said sequence T, defining a child leaf of said parent node, said child leaf comprising the starting position of said portion of said sequence T in said sequence T and said portion of said sequence T itself (see pages DAM2-DAM8: finding the LCS's respective of input strings).

As per claim 2, Morano teaches of a method further comprising recursively performing steps c) - h) for any LCS identified in any of said portions, thereby completely expressing said sequence T in said tree (see pages DAM2-DAM8: evaluating other identified LCS's respective of input strings).

Conclusion

5. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

A. Jiang et al., U.S. Patent Application Publication No. 2004/0044952;

B. Chan et al., U.S. Patent No. 6,697,844;

C. Yariv, U.S. Patent No. 6,359,574;

D. Vitale et al., U.S. Patent No. 6,347,295;

E. Chan et al., U.S. Patent No. 6,178,461;

F. Carus et al., U.S. Patent No. 5,794,177;

G. Clarke et al., "Shortest-Substring Retrieval and Ranking";

H. Engelson et al., "Lossless Compression of High-Volume Numerical Data From Simulations";

I. Kasail et al., "Linear-Time Longest-Common-Prefix Computation in Suffix Arrays and Its Applications";

J. Ferragina et al., "The String B-Tree: A New Data Structure for String Search in External Memory and Its Applications";

K. Bell et al., "Modeling for Text Compression";

L. Acharya et al., "A Tree Based Binary Encoding of Text Using LZW Algorithm";

M. Babu et al., "Parallel Algorithms for the Longest Common Subsequence Problem";

N. Ibarra et al., "String Processing on the Hypercube";

O. Bell et al., "Longest Match String Searching for Ziv-Lempel Compression";

P. Katajainen et al., "An Analysis of the Longest Match and the Greedy Heuristics in Text Encoding";

Q. Hall et al., "Approximate String Matching"; and

R. Larsson et al., "Extended Application of Suffix Trees to Data Compression".

6. An inquiry concerning this communication or earlier communications from the examiner should be directed to Kelvin Booker whose telephone number is (703) 308-4088. The examiner can normally be reached on Monday-Friday from 7:00 AM-5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anil Khatri, can be reached on (703) 305-0282. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306.

An inquiry of a general nature or relating to the status of this application proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Application/Control Number: 09/757,636

Page 6

Art Unit: 2121

K.E.B.

Art Unit 2121

March 26, 2004

Ramesh Patel
RAMESH PATEL
PRIMARY EXAMINER 3/29/04
For Anil Khatris
